

### AMENDMENTS TO THE CLAIMS

1. **(Previously presented)** An isolated or recombinant immunogenic polypeptide comprising a *Lawsonia spp.* FigE Polypeptide, a variant, or a truncated variant thereof, wherein said variant or truncated variant mimics or cross-reacts with a B-cell or T-cell epitope of *Lawsonia spp.* FigE Polypeptide.
2. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 1 wherein said polypeptide elicits the production of antibodies against *Lawsonia spp.* when administered to an avian or porcine animal.
3. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 1 which confers a protective immune response against *Lawsonia spp.* when administered to an avian or porcine animal.
4. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 1 wherein the *Lawsonia spp.* is *L. intracellularis*.
- Claim 5 (Cancelled)**
6. **(Previously presented)** An isolated or recombinant immunogenic polypeptide comprising:
  - (i) a peptide, oligopeptide or polypeptide comprising an amino acid sequence which has at least about 60% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1; or
  - (ii) a homologue or derivative of (i) which mimics a B-cell or T-cell epitope of a *Lawsonia spp.* FigE polypeptide.
7. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 6 wherein said polypeptide elicits the production of antibodies against *Lawsonia spp.* in a porcine or avian animal.
8. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 7 wherein said polypeptide confers a protective immune response against *Lawsonia spp.* in a porcine or avian animal.
- Claim 9 (Cancelled)**
10. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 8, wherein said protective immune response is induced in a porcine animal.

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**Filed** : August 13, 2002

11. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 6 wherein the *Lawsonia spp.* is *L. intracellularis*.

**Claim 12 (Cancelled)**

13. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 6 comprising the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the FigE-encoding nucleotide sequence of pALK11 (ATCC 207156).

14. **(Previously presented)** The isolated or recombinant immunogenic polypeptide of claim 13 consisting essentially of the amino acid sequence of SEQ ID NO: 1 or the amino acid sequence encoded by the FigE-encoding nucleotide sequence of pALK11 (ATCC 207156).

**Claim 15-16 (Cancelled)**

17. **(Previously presented)** A vaccine composition for the prophylaxis or treatment of infection of an animal by *Lawsonia spp.*, said vaccine composition comprising an immunogenic component comprising an isolated or recombinant polypeptide having at least about 60% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1 or an immunogenic homologue, or derivative thereof which is immunologically cross-reactive with *Lawsonia intracellularis*; and one or more carriers, diluents or adjuvants suitable for veterinary or pharmaceutical use.

18. **(Previously presented)** The vaccine composition according to claim 17 wherein the *Lawsonia spp.* is *L. intracellularis*.

19. **(Previously presented)** The vaccine composition according to claim 16 wherein the isolated or recombinant polypeptide comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the FigE-encoding nucleotide sequence of pALK11 (ATCC 207156).

20. **(Previously presented)** The vaccine composition of claim 19, wherein the isolated or recombinant polypeptide consists essentially of the amino acid sequence of SEQ ID NO: 1.

21. **(Withdrawn)** A combination vaccine composition for the prophylaxis or treatment of the infection of an animal by *Lawsonia spp.*, said vaccine composition comprising:

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(i) a first immunogenic component comprising an isolated or recombinant polypeptide having at least about 60% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1 or an immunogenic homologue or derivative thereof which is immunologically cross-reactive with *Lawsonia intracellularis*;

(ii) a second immunogenic component comprising an antigenic *L. intracellularis* peptide, polypeptide or protein; and

(iii) one or more carriers, diluents or adjuvants suitable for veterinary or pharmaceutical use.

22. **(Withdrawn)** A vaccine vector comprising a polynucleotide that encodes the immunogenic polypeptide of SEQ ID NO: 1, a homologue or a variant thereof operably linked to a promoter.

23. **(Withdrawn)** The vaccine vector of claim 22 wherein the polynucleotide comprises SEQ ID NO: 2 a homologue, or derivative thereof which has at least about 60% sequence identity thereto.

24. **(Withdrawn)** The vaccine vector of claim 23 wherein the *Lawsonia spp.* is *L. intracellularis*.

25. **(Withdrawn)** A polyclonal or monoclonal antibody molecule that binds specifically to a FigE polypeptide or a derivative of a FigE polypeptide from *Lawsonia spp.* wherein said derivative has at least about 60% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1.

26. **(Withdrawn)** The antibody molecule of claim 25 wherein the FlgE polypeptide or derivative thereof comprises the amino acid sequence set forth in SEQ ID NO: 1.

27. **(Withdrawn)** A method of diagnosing the infection of a porcine or avian animal by *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising the steps of: contacting a biological sample derived from said animal with the antibody molecule of claim 25 for a time and under conditions sufficient for an antigen:antibody complex to form, and detecting said complex formation.

28. **(Withdrawn)** The method of claim 27 wherein the biological sample is selected from the group consisting of serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces or a rectal swab derived from a porcine animal.

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29. **(Withdrawn)** A method of identifying a previous or current infection with *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising:

contacting blood or serum from said animal with the immunogenic polypeptide of claim 1 for a time and under conditions sufficient for an antigen: antibody complex to form; and detecting said complex formation.

30. **(Withdrawn)** An isolated polynucleotide encoding a peptide, oligopeptide or polypeptide selected from the group consisting of:

(i) a peptide, oligopeptide or polypeptide which comprises an amino acid sequence which has at least about 60% sequence identity to the amino acid sequence set forth in SEQ ID NO: 1; and

(iii) a homologue or derivative of (i) which mimics a B-cell or T-cell epitope of or confers immunity against a *Lawsonia spp* when injected into an animal.

31. **(Withdrawn)** The isolated polynucleotide of claim 30, wherein the peptide, oligopeptide or polypeptide comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the FigE-encoding nucleotide sequence of pALK11 (ATCC 207156) or a B-cell epitope or T-cell epitope thereof.

32. **(Withdrawn)** The isolated polynucleotide of claim 31 comprising SEQ ID NO: 2, a complement or variant thereof.

33. **(Withdrawn)** The isolated nucleic acid molecule of claim 32 consisting essentially of the nucleotide sequence of SEQ ID NO: 2 or a variant thereof.

34. **(Withdrawn)** A method of detecting *Lawsonia intracellularis* or *Lawsonia spp* in a biological sample from a porcine or avian animal subject, said method comprising:

hybridizing one or more probes or primers from SEQ ID NO: 2 or a complement thereto to said sample; and detecting said hybridization .

35. **(Withdrawn)** The method of claim 34 wherein the biological sample is selected from the group consisting of: serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces and a rectal swab from a porcine animal.

36. **(Withdrawn)** The method of claim 34 wherein the detection is by any nucleic acid based hybridization or amplification reaction.

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37. **(Withdrawn)** A probe or primer comprising least about 15 contiguous nucleotides from SEQ ID NO: 2 or the complement thereof.
38. **(Withdrawn)** The plasmid pALK13 (ATCC Accession No. 207196).
39. **(Withdrawn)** The combination vaccine according to claim 21 wherein the second immunogenic component is selected from the group consisting of SodC, FliG, hemolysin and autolysin.